

**Orbital ordering in single-layered manganites $\text{Nd}_{1-x}\text{Sr}_{1+x}\text{MnO}_4$ with
 $x \sim 0.75$**

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We report a result of a neutron diffraction study on single crystals of single-layered manganites $\text{Nd}_{1-x}\text{Sr}_{1+x}\text{MnO}_4$ with $x \sim 0.75$. We observed a switching of the type of the orbital order around this composition. In $x = 0.75$, nuclear and magnetic superlattice reflections with a propagation vector $\mathbf{q} = (1/8, 1/8, 0)$ were observed in the ab plane, indicating the charge-orbital ordering with $\text{Mn}^{3+} : \text{Mn}^{4+} = 1 : 3$ which is similar to the one observed in $\text{La}_{1/3}\text{Ca}_{2/3}\text{MnO}_3$ [1]. On the other hand, in $x = 0.78$, a tetragonal to orthorhombic structural transition occurs as temperature decreases, followed by the C-type antiferromagnetic spin ordering. This infers the rod-type orbital ordering in the ab plane.

[1] P.G. Radaelli, D.E. Cox, L. Capogna, S.-W. Cheong, M. Marezio, Phys. Rev. B **59**, 14440 (1999).